

TECHNOLOGY READINESS LEVEL: 6

US PATENT # 7,816,482

DELIVERABLE PROTOTYPE TESTING HAS BEEN CONDUCTED

TECHNOLOGY SUMMARY

Polymer electrolyte fuel cells (PEFCs) have been identified as an attractive electrical power source due to it having a higher efficiency level and being an environmental friendly energy source. In comparison with other types of fuel cells, PEFCs have a high power density, low weight to power ratio, and utilize a proton exchange membrane (PEM) as its electrolyte. Some types of membranes that are in use have displayed issues such as reduced conductivity and membranes dehydration at high temperatures.

Sandia National Laboratories has created an improved composition for producing proton exchange membranes for use in fuel cells, electrode casting solutions, and in sulfur dioxide electrolyzers. This invention features an innovative cross-linked sulfonated poly (phenylene) copolymer composition. The cross-linked feature will remove the issues that previous types of membranes had and will result in membranes that are tougher, have high temperature capabilities, and have lower SO₂ crossover rates.



POTENTIAL APPLICATIONS

- Chemical Applications
- Transportation and Automotive
- Fuel Cells
- Dialysis Equipment
- Ultrafiltration

TECHNOLOGICAL BENEFITS

- Increased ionic functional group density, leading to tougher membranes with higher IECs
- Design remains consistent at elevated temperatures
- Enhanced Water Management
- High Conductivity and Efficiency

TECHNOLOGY INQUIRY?

For more information or licensing opportunities contact us at

ip@sandia.gov

Refer to SD # 11210

or visit

<https://ip.sandia.gov>